

WHAT IS CLAIMED IS:

1. A temperature measuring method of measuring a temperature of a susceptor which is disposed in a conductive vessel and on which a substrate to be processed is to be placed, the conductive vessel being set to a ground potential and having a space formed therein in which a plasma is generated by application of a radio frequency power, the method comprising:

forming an opening in a portion of the conductive vessel facing a predetermined temperature measured portion on a rear face side of the susceptor, the opening having a size not allowing the radio frequency power to leak to an external part; and

detecting, at an external part of the opening, an infrared ray emitted from the temperature measured portion to measure the temperature of the susceptor by a radiation thermometer.

2. A temperature measuring method as set forth in claim 1, wherein a diameter of the opening is set to $1/50$ of a wavelength of the radio frequency power or smaller.

3. A temperature measuring method as set forth in claim 1, wherein a frequency of the radio frequency power is 40 MHz or higher.

4. A temperature measuring method as set forth in claim 1, wherein the temperature measured portion of the susceptor has a shape recessed toward a face on which the substrate to be processed is to be placed.

5. A temperature measuring method as set forth in claim 1, wherein the temperature measured portion of the susceptor is structured to act as a blackbody to the infrared ray.

6. A plasma processing apparatus comprising:

a conductive vessel being set to a ground potential and having a space formed therein in which a plasma is generated by application of a radio frequency power; and

5 a susceptor which is disposed in said conductive vessel and on which a substrate to be processed is to be placed,

wherein said conductive vessel has an opening that is formed in a portion facing a predetermined temperature measured portion on a rear face side of said susceptor and that has a size not allowing
10 the radio frequency power to leak to an external part, and a radiation thermometer detects, at an external part of the opening, an infrared ray emitted from the temperature measured portion to measure a temperature of said susceptor.

7. A plasma processing apparatus as set forth in claim 6,
15 wherein a diameter of the opening is set to $1/50$ of a wavelength of the radio frequency power or smaller.

8. A plasma processing apparatus as set forth in claim 6, wherein a frequency of the radio frequency power is 40 MHz or higher.

20 9. A plasma processing apparatus as set forth in claim 6, wherein the temperature measured portion of said susceptor has a shape recessed toward a face on which the substrate to be processed is to be placed.

10. A plasma processing apparatus as set forth in claim 6,
25 wherein the temperature measured portion of said susceptor is structured to act as a blackbody to the infrared ray.